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The Maryland Fruit Grower

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Edited by the Secretary, A. F. Vierheller, Extension Horticulturist

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GUESS WHAT

--- 10 ---

The Maryland Fruit Grower is ten years old this month.

In February, 1931, President G. S. L. Carpenter advocated a printed monthly publication, replacing the monthly mimeographed News-Letter. Mr. Carpenter even solicited the commercial advertising and most of the papers for the first issue. The first number was printed with the hope as expressed in the Foreword—"that you will help us to improve, and that this publication will add to your knowledge and enjoyment, we dedicate it as our effort to promote better fruit growing everywhere."

Our first advertisers were: B. G. Pratt Company, John Bean Mfg. Co., Koppers Products Co., Lupton Orchard Service Co., Sun Oil Co., Moore & Munger and Niagara Sprayer & Chemical Company. The papers were furnished by Dr. E. C. Auchter and Dr. J. R. Magness, U. S. Department of Agriculture.

The Maryland Fruit Grower now goes all over the country, and some of its contents are re-printed by other horticultural publications. We hope that this paper has been of pleasure or help to the readers, and we welcome any criticisms. Our sincere gratitude goes to our advertisers who have shown their faith in the industry and the Society by helping us to support this publication through their continued patronage. Let's remember them when we purchase our orchard supplies.

COLD STORAGE HOLDINGS—FEBRUARY 1

Cold Storage Report released February 13 by Agricultural Marketing Service, U. S. Department of Agriculture showed the following figures:

	Feb. 1 5 yr. av. 1935-39	Feb. 1, 1939	Jan. 1, 1940	Feb. 1, 1940
Apples				
Barrels	358,000	149,000	202,000	156,000
Western				
Box	11,190,000	10,520,000	10,286,000	8,199,000
Eastern	previously reported with			
Box	"bushel baskets"		7,788,000	5,787,000
Bu. Baskets	9,697,000	10,006,000	7,518,000	5,858,000
Total	21,961,000	20,973,000	26,198,000	20,312,000

On January 1, 1940, 203 cold storage concerns in Middle Atlantic States reported 49% of available space filled, and on February 1, 209 concerns reported 40% of space filled. For the United States, 45% of available space was filled on January 1, and 38% of space was filled on February 1.

SHOULD WE USE DINITRO OR TAR OIL FOR DORMANT SPRAY?

W. S. HOUGH, *Entomologist,*
Virginia Experiment Station, Winchester, Virginia

The title of this discussion is a question to which I will respond by summarizing our experience of 1939.

In northern Virginia the outbreak of rosy apple aphids in 1939 varied widely from orchard to orchard and in different parts in the same orchard. In the extreme northern part of the state, little or no damage resulted even on unsprayed trees.

The results presented here refer to experimental work carried out in orchards at Winchester, Luray and Timberville. Only at the last named location did the rosy apple aphids do any damage on the unsprayed check trees which is our only clue to the possible value of the tests in estimating results on the control of this insect. Even in the Timberville orchard the infestation varied greatly and, of course, the results obtained with the various materials varied accordingly. That is, in areas of light infestation all materials gave excellent control while in heavily infested areas some did not give satisfactory control. In Table 1 the tests are grouped according to the severity of the infestation as indicated by the average number of infested clusters found on the unsprayed check trees occurring in that section of the orchard. Some of the materials were used for the first time and we hesitate to draw any conclusions from a single season's results, therefore, the data are presented without comment.

As was to be expected from the nature of the outbreak of rosy apple aphids in many orchards, all kinds of control (excellent to no control at all) were attributed to the materials used. But the kind of materials used was not necessarily the only factor influencing the results. The results also varied according to the degree or quantity of the infestation; to weather conditions prevailing at the time of spraying; and to the condition of the spray mixture in the tank, that is, whether the materials were properly dispersed in the water or were separating in the spray tank.

In the orchards where the rosy aphids did not appear we could use only the count of the "green aphids" found on the bud tips in the delayed dormant stage as an index to the possible egg-killing powers of the dormant sprays (Table 2). I hesitate to say that such an examination furnishes a reliable index of efficiency for control of rosy apple aphids. At most it may possibly shed a little light on what one might expect to follow, if the rosy aphids should occur in the orchard.

Some of the results obtained against scurfy scale in a heavily infested orchard are shown in Table 3. These sprays were applied under excellent conditions and most materials gave a high degree of control.

Mention should be made of evident injury on some of the trees in this orchard which received 4 percent oil and 8 ounces of dinitro-o-cyclo-hexyl-phenol. On the injured twigs and branches all, or nearly all, of the lateral buds failed to open. The result was that few or no leaves appeared on the 1938 wood. Not all injury of this type, however, can be attributed to the dormant sprays. Similar injury was observed on young, vigorous apple trees which did not receive any dormant or delayed dormant sprays. It will be recalled that the most severe weather of last winter occurred November 26, 27 and 28 when the minimum temperature ranged only 7 to 9 degrees above

— FOLLOW THE "O R T H O" BALANCED SPRAY PROGRAM —

FOR DORMANT AND DELAYED DORMANT TREATMENT OF

APPLE PESTS

IN CUMBERLAND-SHENANDOAH VALLEYS

◆

Against ROSY APHID, RED MITE, and certain SCALE insects, make a dormant application of Nitro KLEENUP Emulsion (3 to 3½ gallons for 100 gallons of spray). As an alternative, use ORTHO Tar Oil Emulsion (3 gallons) with KLEENUP Emulsion (3½ gallons).

◆

Against SCURFY SCALE add 5 quarts of "KLEENUP" to the Nitro KLEENUP Emulsion.

◆

For delayed dormant treatment of these pests (if dormant treatment was not made), use KLEENUP Emulsion (3½ gallons for 100 gallons of spray) with ORTHO Tar Oil Emulsion (½ gallon).

◆

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zero. At that time the apple trees had not become completely dormant because the weather prior to that time had been unusually mild. Many of the lateral buds were killed or weakened and died during the winter. Others were weakened and succumbed to the shock of the dormant spray, especially where concentrations of oil exceeding 3 percent were used with 8 ounces of dinitro-o-cyclo-hexylphenol per 100 gallons. Indications also were obtained that dinitro-o-cresol and dinitro-phenol at the same dilution in oil sprays exceeding 3% strength were equally toxic to apple buds. While similar conditions may not occur in this section for many years, it is apparent that the amount of oil that can be safely used in dinitro sprays is definitely limited. Two percent oil with 8 ounces of dinitro-o-cyclo-hexylphenol and 3% oil with 6 ounces of the dinitro ingredient appear to be within the range of safe combinations and at the same time have given control of rosy aphids when applied in March.

Table 1.—Results of some orchard experiments for control of the rosy apple aphids, Timberville, Va., 1939.

Materials used and amount per 100 gal.	Infested clusters per tree (Avg.)
Nitro-Kleenup 3 gal.	0
Oil 3% and tar oil 2½%	5
Dowspray Dormant 2 gal.	3
Oil 2 % and Dry Mix-DN 1¾ lbs.	116
Oil 3% and Dry Mix-DN 1¾ lbs.	28
Checks, not sprayed	1218
Nitrocide (Dormocide) (2% toxic) 3 gal.	122
Dow Dormant 1¼ lbs. (8 oz. DNOCHP)*	11
Checks, not sprayed	982
Oil 2% Dow Dormant Powder 1 lb. (6 oz. DNOCHP)*	12
Oil 2% & Dow Dormant Powder 1¼ lbs. (8 oz. DNOCHP)*	1
Nitro-Kleenup 3½ gal.	0
Elgetol 1 gal.	0
Checks, not sprayed	210
Nitrocide (Dormocide) (1% toxic) 3 gal.	2.7
Nitrocide (Dormocide) (3% toxic) 3 gal.	13.2
Oil 2% & Dow Dormant Powder 1¼ lbs. (8 oz. DNOCHP)*	0.4
Checks, not sprayed	174.0

*DNOCHP signifies di-nitro-oxy-cyclo-hexyl-phenol.

Table 2.—Green aphids found on green bud tips of trees sprayed with various dormant sprays in March 1939.

Materials used and amount per 100 gallons	No. of live aphids per 300 buds	
	Stayman Orchard	Rome Orchard
Nitro-Kleenup 3 gal.	7	3
Oil 3½ & tar oil 2½%	7	11
Dowspray Dormant 2 gal.	3	8
Oil 2% & Dry Mix-DN 1¾ lbs.	0	
Oil 3% & Dry Mix-DN 1¾ lbs.	6	0
Nitrocide (Dormocide) (1% toxic) 3 gal.	62	3
Nitrocide (Dormocide) (2% toxic) 3 gal.	29	21
Nitrocide (Dormocide) (3% toxic) 3 gal.	94	30
Elgetol 1 gal.	0	
Nitro-Kleenup 3½ gal.	0	0
Dow Dormant Powder 1¼ lbs. (8 oz. DNOCHP)*	12	
Oil 2% & Dow Dormant Powder 1¼ lb. (8 oz. DNOCHP)*	2	
Checks, not sprayed	822	299

*DNOCHP signifies di-nitro-oxy-cyclo-hexyl-phenol.

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Table 3.—Results of some dormant sprays against scurfy scale, Winchester, Virginia, 1939.

Materials used and amount per 100 gallons	Percent Control
Elgetol 1 gal.	95.0
No. 6 Soluble oil 3 gal.	100.0
Oil 4% (Goulac-Bentonite emulsifier)	92.0
Oil 4% (83% emulsion 4¾ gal.)	92.0
Nitrocide (Dormocide) (1% toxic) 3 gal.	99.0
No. 6 Soluble oil 3 gal. & Dow Dormant Powder 1¼ lbs. (8 oz. DNOCHP)*	100.0
Oil 4% Dow Dormant Powder 1¼ lbs. (8 oz. DNOCHP)*	98.0
Checks, not sprayed	96% hatched

*DNOCHP signifies di-nitro-oxy-cyclo-hexyl-phenol.

Have You Read the Advertisements?

DORMANT AND DELAYED DORMANT SPRAYS FOR APPLES

C. GRAHAM, *Extension Entomologist,*
University of Maryland

The questions always arise at this time of year as to which of the many spray materials the fruit grower should use, and whether to use the dormant or delayed dormant spray.

If every orchard in the state had an equal infestation of the same kind of insects, we could make one definite recommendation for a dormant or delayed dormant spray that would fit every orchard. But such conditions do not exist. Some orchards are infested with San Jose scale; others have scurfy scale; while others have no scale insects but are infested with red mite. Occasionally an orchard is practically free from any of these pests and still others have all of them and more beside. So it is impossible to make any straight recommendation to fit conditions in all orchards. The grower should become familiar with his particular conditions and select his spray program to fit these conditions. He should be in position to decide whether to use a dormant spray or a delayed dormant spray.

However, my observations have been that most growers who depend upon applying a delayed dormant application to the entire orchard (in some years) do not finish the application before the first scab spray is due. The most practical procedure, therefore, would be to spray the entire orchard in the dormant period, or at least cover enough of it that, with even unfavorable weather conditions, the remainder of the orchard could be covered during the delayed dormant period.

Strictly Dormant Sprays

Tar-Petroleum Oil combination—This tar-petroleum oil combination can be purchased on the market ready-mixed, and should contain the petroleum oil and tar oil in proportions to give a spray of 3% petroleum oil and 2½% tar oil. If the stock mixture does not contain enough petroleum oil to equal 3% when the 2½% tar oil is reached in the finished spray, enough petroleum oil emulsion should be added to bring it up to 3% strength. This combination spray will kill *aphid eggs, red mite eggs, scurfy scale, oyster shell scale, and San Jose scale.*

Dinitro-oil combination—This material purchased ready-mixed and emulsified will kill *San Jose scale* and *aphid eggs.* However, if *European red mite, scurfy scale,* or *oyster-shell scale* is present, enough *petroleum oil emulsion* should be added to bring the strength of the oil up to *4%.* Apply this

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mixture *only when the trees are strictly dormant* or serious injury may occur.

Delayed Dormant Sprays

A petroleum tar-oil combination may be used for delayed dormant spray, using the following mixture: Sufficient petroleum oil emulsion to give an actual 3% oil content, and *2½ quarts* of tar oil per 100 gallons of spray. Note that this is *2½* quarts of tar oil per 100 gallons of spray while the dormant spray is *2½%* tar oil. Tar oil in this mixture is cheaper than cresylic acid and is reported to be as effective against aphid eggs, used in the *2½* quarts per hundred gallon concentration. This spray will kill *San Jose scale* and *aphid eggs* if applied *thoroughly* and at the *correct time.* If the orchard is infested with *scurfy scale, oyster shell scale,* or *European red mite,* a 4% *emulsion* instead of 3% should be used alone *instead* of the above mixture of tar oil and petroleum oil.

Concentrated lime-sulfur 12½ gallons, and water to make 100 gallons of spray *will kill San Jose scale,* but *will not kill red mite eggs, scurfy scale,* or *oyster shell scale.* Neither will it kill *aphid eggs* without addition of *1% nicotine sulphate* to each 100 gallons of lime-sulfur spray.

Delayed dormant sprays have one point in their favor, and that is cheapness. The petroleum oil emulsion plus either ½ gallon of cresylic acid (per 100 gallons) or 2½ quarts of tar oil is less expensive than either of the *dormant sprays* recommended, but this advantage is outweighed by the disadvantages. The delayed dormant lime-sulfur spray is cheaper than the dormant sprays, but is *not effective against aphid eggs, red mite eggs, scurfy scale,* and *oyster shell scale.*

The time factor, as stated, is the most serious objection to the delayed dormant sprays. In some years, the delayed dormant period lasts only a few days, and this makes it impossible for the grower to cover his entire orchard. Such orchard practices lead to trouble, for scale insects, red mites and aphids build up rapidly and should not be given a year's chance to increase in number.

Just a Reminder

This has been a bad codling moth year. Millions of the moth worms are now asleep under the bark of your apple trees, in your picking boxes, baskets and barrels, and in cracks and crevices around your packing shed. These worms will awaken in spring, turn into moths and begin to emerge and lay eggs in your orchard around May 10. The off-spring of these early moths will feed heartily, increase, and destroy your fruit throughout the season. Are you going to clean up the packing shed, make it moth-proof, or remove those boxes, baskets and barrels a safe distance from the orchard? Are you going to scrape those trees while the weather is cold and the bark comes off easily, or will you just snooze along while the worms are snoozing this winter and awaken next summer several weeks *after* the worms have awakened and find the damage already done? No use to cry over spilled milk. Start now to prevent the spilling.

THE GO-GETTER

Don't waste time trying to figure out why a black hen eats yellow corn and lays white eggs. Get the eggs. And don't lose time trying to figure out why little white worms eat either little green apples or big red apples. *Get the worms.*

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HOW ABOUT THE SPRAY EQUIPMENT?

Maybe this is a late reminder, for that dormant spray is ready to go on the trees whenever the weather is fit. Here is some advice found in January, 1940, Tennessee Horticulture:

In the "old West" when a man's enemies were merciless and his life often depended on a quick "draw" of his trusty shooting iron, he kept this life-saver clean, well-oiled and ready for instant action. Today's fruitgrower has merciless enemies and his living depends upon the timeliness and skill with which he uses his sprayer. He should use some of the slack time of winter to overhaul his sprayer.

The average grower is afraid to get acquainted with the "innards" of a modern sprayer, and does so only when the desperation of a breakdown at a critical time compels him. He is ignorant of what to look for, and, if he happens to locate the trouble, he is more ignorant about the means to correct it. The salesman or dealer who sells a new sprayer, usually boasts of either its failure-proof features or the ease of making replacement of wearing parts. Unless the grower is familiar with the machine he buys, it is advisable to make the seller prove his claims by removing representative wearing parts and replacing them. It is the grower's right and duty to request this demonstration.

Because of the number of different types of sprayers, only general directions can be given for the winter overhaul. Let's follow some spray material and indicate the points which need to be checked. The materials are poured through the tank strainer. This should be sound and reasonably free from imbedded grit. Brush it clean and paint with light cylinder oil. Then the suction strainer. These do not usually last more than two seasons. Replace with 20 to 30-mesh heavy copper screen. Examine suction hose for worn or weak spots and make sure that the hose clamps are tight and that the bolts can be tightened if necessary. Better loosen them and coat the threads with graphite grease.. Now the intake valves of the pump (nearest the hose inlet). Remove cap and valve. Clean valve and examine carefully for pits or deep scratches. Remove seat, clean and examine. Replace if badly worn or injured. Light cuts or scratches or slight unevenness may be removed from some types of valves by grinding. In early fall overhauling

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of machines which will not be used until late winter, the valves may be cleaned and kept in a jar of clean oil. In replacing, use sound gaskets under seat and cover.

Next the plunger-cylinder combination, where pump-power or pressure originates. Pitted, chipped or scored cylinders should be replaced. Plungers are generally fitted with a composition "leather" to make it fit the cylinder snugly and usually it is best to replace this each year. Replace also any thin, metal, plate or coil springs with which spray material comes in contact. The outer end of the plunger is usually surrounded with a packed collar which prevents material which passes the plunger cup from escaping and keeps the plunger accurately lined up with the cylinder. Unless special cut-ring packing is supplied by the manufacturer, it may be repacked by wrapping with several strands of "candlewick" packing which has been well coated with graphite grease.

The outlet or discharge valves receive the same treatment and care as the intake valves and this is true of those in the relief-or automatic overflow-valve setup. Two other points in the relief valve need annual replacing. In the base of this device is usually a large, flat composition-rubber plate called the diaphragm. As oils tend to swell and decompose the rubber and it loses its elasticity. This should be replaced, but be sure that all holes line up accurately. The valve stem which rests on this diaphragm should be removed and carefully cleaned and polished. The upper part of this stem passes through a small packing nut or gland and this should be repacked with either special packing or graphited candlewick. From the relief valve the material passes into a pipe leading to the hose lines. Since scales of dried spray material or rust may have formed in this pipe, it should be removed, pounded on all sides with a light hammer and the trash removed by thumping the end on a wood floor or block. Examine cutoffs and discard those which cannot be repaired to cut off the flow completely. Repack the gland on the handle. Examine hose for weak spots and see that the hose clamp bolts turn freely so that they may be tightened or removed readily in the field if necessary. Repack shut-off valve stems on rods or guns. Replace nozzle discs and rubbers and coat threads of nozzle caps with grease.

We have followed the spray material through to the nozzle, but there are other parts about the pump which may need checking. In most pumps the power to the plunger stroke is applied through a crank-shaft or eccentric. This may be above the cylinder, below it, or on one side. Provision is made by the manufacturer to take up wear or lost motion by removing shims in the connecting rod bearing cap. This should be done with caution and the fit left just snug, but with bolts tight and cotter-keyed. Remove grease cup or fittings to be sure the lubricant reaches the moving surface of shafts. If the crank-shaft runs in an oil bath, drain, flush and refill the crank-case to the proper level with oil of the recommended grade.

It is best to have the power unit checked by a competent mechanic, but the grower should, and usually must, learn to service his own pump. Aside from pump and engine, the other points to check are relatively simple. Belts, chains and sprockets should be checked for wear. tension and alignment. The tank should be cleaned inside and out, and the outside, at least, protected with implement paint. Thin metal parts, such as the cover to the pressure gauge, guards over chains and gears, etc., should be brushed free of loose paint or spray deposits, and painted. The agitator shaft gland should be repacked. Wheels should be greased and any slack bolts tightened so that when the "bugs" and the weather say "go" your sprayer will be ready.

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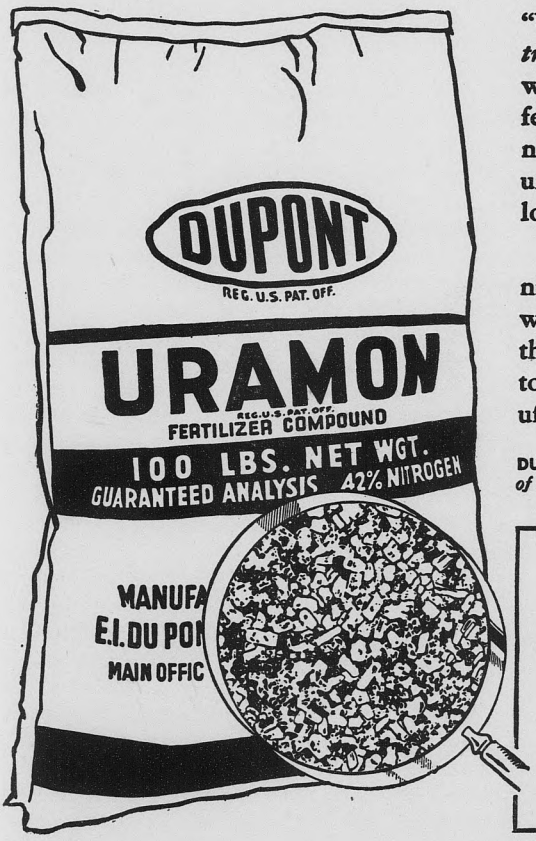

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AMMONIA DEPARTMENT

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THOUGHTS ON PRUNING

Lots of old trees have been pulled out, and there are some young blocks of trees coming on. We have seen the effects of good or bad pruning as it affected breakage, production or tree vigor. An article by Prof. Victor W. Kelley, Department of Horticulture, University of Illinois, as printed in January, 1938, Wisconsin Horticulture, may refresh our memories so that we will "have a reason for every cut." The article follows:

More than two centuries ago La Quintinye, the great French gardener, wrote, "Everybody cuts but few prune." About 75 years ago a speaker at one of the sessions of the Illinois State Horticultural Society recommended "buy a pruning knife but leave it at home until you have learned how to prune." These statements indicate that a long time ago pruning was considered important by horticulturists, and that there was much difference of opinion as to how it should be done.

Mistakes in pruning can usually be traced to lack of a definite purpose. It may be truthfully said that such indiscriminate cutting is often worse than no pruning. To prune *profitably* one must prune *intelligently.* The ultimate purpose of pruning is to increase profits. There may be aesthetic values in certain types of pruning, to give definite shapes to plants, but to the commercial fruit grower pruning is an expensive operation, the only justification for which is that it may help to "ring the cash register."

Some of the responses of the tree to pruning have been determined experimentally.

PRINCIPLES INVOLVED

1. *A good framework can be developed only when the tree is young.* The time when the framework is being formed is one of the most critical periods in the life of the tree. The nature of the pruning treatment at this time has far-reaching consequences. It will not only determine the type of framework, but the cuts made during this early period will determine the type and amount of pruning which must be done in later years; and, because of this influence, it will affect the time of coming into bearing, the rapidity of growth, the size of crop, and even the longevity of the tree.

In order to be practicable, a method of securing a suitable framework must fulfill certain requirements, viz. (1) It should produce a strong framework which is capable of bearing large crops over a period of time. (2) It should insure a permanent framework which will not be crowded out. The original framework should remain at maturity. (3) To be feasible from the viewpoint of the fruit grower, the framework must be secured quickly. (4) A satisfactory method must bring the trees into profitable production at an early age.

2. *Pruning is relatively local in its stimulating effect.* An ordinary pruning cut stimulates growth in the vicinity of the cut, but has little effect upon the growth of a neighboring branch. On the basis, a larger number of comparatively small cuts is preferable to a few large cuts. This principle is involved in the detail pruning which is being advocated for bearing apple trees.

3. *Upright branches grow more rapidly than horizontal branches.* Vertical branches as a rule grow very rapidly; they seem to have an advantage in securing nutrients, water, and sunlight. On the other hand, horizontal or drooping branches tend to grow very slowly and for this reason should not be selected for the framework although their crotches are strong. Branches

with moderate angles grow rapidly enough to secure adequate tree size and they also form strong unions with the trunk.

4. *Narrow-angled branches form weak crotches.* Experience, as well as research, has shown that a branch which leaves the trunk at a narrow angle, that is an upright direction, forms a weak union with the trunk. In such a case, instead of the branch being tied to the trunk with strong, woody, crotch tissue, bark is caught at the union of the trunk and branch, and they are really tied together at this point only by bark. If the angle is relatively wide, that is if the branch leaves the trunk in a somewhat more horizontal direction, no bark will be caught, and the crotch tissue will be made up entirely of wood and will possess great strength.

5. *A branch originating directly over another will eventually shade out and starve the lower one.* Two factors seem to be responsible for this. The upper branch probably has the advantage in position with reference to the food supply as it is transported in the phloem, and since it shades the lower one it interferes with its food manufacture by reducing the light for photosynthesis. In the training of young trees, a lateral arising from the trunk directly over the framework branch should never be selected as a part of the permanent framework.

6. *Too many branches arising from the trunk detract from the growth of individual branches but contribute to the total growth of the tree.* The opinion is sometimes heard that since pruning delays initial bearing all pruning should be postponed until the bearing habit is established. Such a plan is feasible so far as early bearing is concerned but is unsatisfactory from the viewpoint of a desirable framework. Experience has demonstrated that when a large number of branches are allowed to become established along

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the trunk frequently none of them becomes dominant. When the time comes to begin cutting out the superfluous ones, the remaining framework branches are disappointing in size.

7. *Pruning a branch decreases its growth.* In an experiment at the Illinois Station two branches of equal size were selected on the same tree. One of the branches was pruned heavily and the other left unpruned. At the end of the season it was found that the unpruned branch had increased in diameter 218%, while the one heavily pruned had grown only 22%. This principle is frequently used in pruning to keep a tree symmetrical, by pruning a branch which is growing very much faster, more severely than the others.

8. *Pruning has a dwarfing effect upon the tree as a whole.* The leaf is the tree's manufacturing plant for food materials and any practice which reduces the leaf surface lowers the food supply and lessens growth. At the Illinois Experiment Station 800 apple trees were divided into four groups, each group receiving a different pruning treatment; group 1 was pruned lightly, group 2 moderately, group 3 severely, and group 4 was left unpruned. At the end of five years the unpruned trees had increased in circumference 85%, the lightly pruned, 80%, the moderately pruned, 75%, and those heavily pruned, 67%. Thus the pruning dwarfed the trees in proportion to its severity. Experiments have also shown that pruning dwarfs the root system of apple trees. An understanding of this principle will make it clear that pruning should be only severe enough to accomplish the purpose intended, and that every cut made beyond this point is an economic loss.

9. *Pruning increases the vigor of growth* The laterals on a pruned branch will be longer than on a similar one which has not been pruned. Since the number of growing points is reduced, the individual laterals grow somewhat faster than if the entire number were allowed to start. However, the gain in leaf surface on individual shoots due to the increased vigor is not sufficient to make up for the loss of foliage from the buds removed by pruning, and the net result is a decrease in growth for the tree as a whole.

10. *Another principle which has been conclusively proved by experimental work is that pruning the young apple tree delays its coming into bearing.* At the Illinois Experiment Station in the experiment with 800 trees referred to above, at the age of 10 years, five years after the experiment started, 95% of the unpruned trees produced fruit, while only 85% of the moderately pruned and 70% of the heavily pruned bore any fruit. In the formative period, the energy of the apple tree has been used primarily in the production of vigorous wood growth. Fruit buds are formed as a result of a rather delicate balance between the nitrates and carbohydrates in the tree. The very young tree does not produce fruit buds because it is growing too vigorously; the nitrates are too high in proportion to the carbohydrates; a change must be made before fruit can be borne. In the apple the transition from vigorous wood production to the formation of fruit buds is made quite gradually. Any practice of the fruit grower which tends to maintain a condition of excessively vigorous shoot growth will delay the formation of fruit buds. Severe pruning perhaps more than any other single practice tends to promote vigorous shoot growth.

11. *Pruning decreases the crop in young bearing apple trees.* In the experiment referred to immediately above, the severe, moderate, light and no pruning comparisons were continued for about 10 years. Throughout the entire period the unpruned trees produced more marketable fruit than any of the pruning treatments. The reduction in yield was in proportion to the

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severity of the pruning. Moderate pruning decreased the total yield about one-half while severe pruning reduced the crop approximately three-fourths.

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ANNUAL DUES

The 1940 memberships are payable NOW. Paid-up members will receive not only the Maryland Fruit Grower and the Proceedings of Annual Meeting, but also a year's subscription to The American Fruit Grower Magazine, by an arrangement with the publishers. It is a lot of bother to send in the names of straggling members, month by month, so any memberships received after February 29 *will not* be sent to the American Fruit Grower. Please send one dollar cash, check or money order, to A. F. Vierheller, College Park, Maryland, as soon as possible, and be an active member. If the Society is to speak and act for the fruit growers of Maryland, it must have their active, interested support. DO IT NOW.

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PEACH ORCHARDS—CULTIVATION VERSUS SOD

We still continue to cultivate peach orchards, though less than we used to do. Some growers wonder about use of permanent cover crops in peaches and the answer is that this is still experimental. However, the following article, a digest of a talk given by W. W. Magill, Extension Horticulturist of Kentucky, is taken from May 1939, News-Letter of Illinois State Horticultural Society, and is printed here as a matter of interest, not as a recommendation:

"My observations for the past 15 years in Kentucky show that nitrogen is just as important for the peach orchard as tankage is for producing hogs or, I might say, as important as milk for a baby. In other words, it is simply a part of peach production program. One-fourth pound per tree applied during May of the first growing year with one-third per pound applied during the second growing year are very economical expenditures when you take into consideration the benefits derived from such an expense. As the orchard grows older an increasing amount, depending on the size of the crop, the off year of the orchard and the amount of natural fertility in the soil, will all have to be taken into consideration in deciding how much commercial nitrogen should be applied, and when. In Kentucky we are very partial to planting tobacco in the peach orchard during the first or second year. Any of our standard truck crops we consider desirable for interplanting in the peach orchard the first few years, with the exception of strawberries. We certainly do not advise strawberries with peaches. We have quite a number of observations which convince us beyond a question of doubt that there is something about strawberries which gives the land a toxic condition for peach trees, with the result that any time from the 5th year on, the peach trees lose their vigor and become practically useless.

Some of you men who attended our summer field meeting near Paducah last July visited a peach orchard carrying an 8,000 bushel crop of peaches. This orchard, as you will recall, was in Korean lespedeza and had been for 4 years. During the first 5 years of this orchard, clean cultivation had been practiced, during which time sheet erosion had taken away the first four or five inches of soil, in spite of using winter cover crops. Gullies from 1 to 4 feet deep was the result.

In that locality this year we had no rains from late April until after

harvest, with the exception of a couple of local showers, which hardly laid the dust. As evidence, the soil was dry I collected soil samples with a soil auger at 6 inch, 1 foot and 2 feet depth on June 5th and 29, and August 8. These samples were carefully analyzed for moisture percent. It is hard to believe that the moisture could be as low as 5% in the top 6 inches of soil and only 8% at 12 inches depth. Yet the peach trees did not wilt but continued to grow and size up fruit to marketable size. On one particular tree which was typical of other trees nearby, on August 8th, I helped pick 4 bushels that were 2½ inches and up minimum and we left 3 bushels on the trees that were harvested 4 days later and which had put on good size. Soil samples collected under this particular tree on August 8th showed 7.2% moisture at the 12-inch depth and 9.6% moisture at 24-inch depth.

Those of you who saw this orchard at Paducah in August with no cultivation for 4 years will be interested in the picking and packing house record which showed that 80% of the 8,000 bushels packed out 2¼ inches and up, with about 35% packing 2½ inches and up.

Now please do not misunderstand me and quote me as recommending no cultivation on bearing peach orchards. I am not recommending anything to you. The owner of this orchard in lespedeza is thoroughly sold on his "no cultivation" program and I am sure the record of production during the next few years will be of interest to many peach growers. I must say in passing, however, that nitrogen was used quite liberally on this sod orchard. It had 2 pounds of calcium cyanamid in March, 2 pounds of soda per tree in May and 2 pounds of soda in early July. He had a splendid wood and bud growth for the 1937 crop. You will be interested in some moisture percents on a 40-acre orchard carrying a good crop near Henderson. This orchard was planted on good soil and its owner is just as radical for cultivation as the other man mentioned is for no cultivation. On August 7, in this 7-year-old Elberta orchard, which had received frequent cultivation with a tractor disk all season, and with no rainfall to more than lay the dust since April, the samples collected showed the following moisture: 12 inch depth, 5.4%; 24 inch depth, 9.8%. On another area in this same orchard under cultivation the analysis showed the following: At 6 inch depth 8%, 12 inch depth 13% and 24 inch depth 13.7%. In other words, clean cultivation on this dry year failed to keep a very high percent of moisture."

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Little Girl—"Please, ma'am, they are the sins that we ought to have committed, but didn't."

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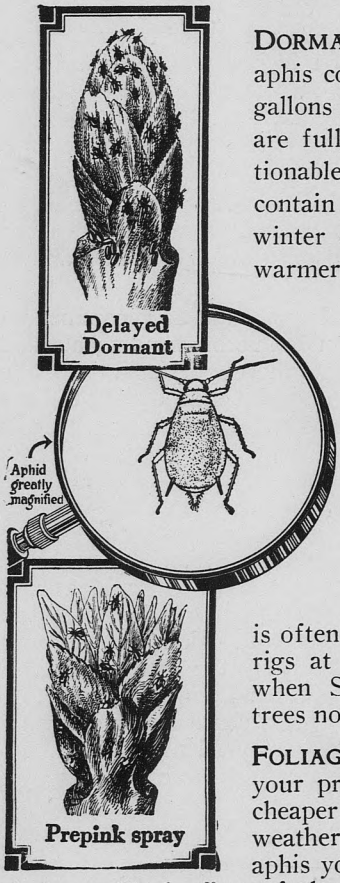

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DELAYED DORMANT SPRAY. An equally effective aphis control is the use of 1 or 1½ gallons Straitar with regular Scalecide, 1 to 15, or with 3% oil emulsion, as a delayed dormant spray. Besides the advantage of using tar oils at weak dilutions, it is often easier to get into the orchard with the spray rigs at the delayed dormant season. Furthermore when Scalecide is used, there are benefits to the trees not obtained with any other spray.

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